



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,206	03/12/2004	Daryoosh Vakhshoori	AHURA-5	8566
7590 05/19/2005			EXAMINER	
Mark J. Pandiscio Pandiscio & Pandiscio, P.C. 470 Totten Pond Road Waltham, MA 02451-1914			KIM, JOANNE H	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/800,206

Applicant(s)

VAKHSHOORI ET AL.

Examiner

Joanne H. Kim

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification fails to provide proper antecedent basis for "said filter fiber pigtail is a multi-mode filter fiber pigtail" in claim 17.

Claim Objections

3. Claim 18 is objected to because of the following informalities: "multi-node" in line 2 should be "multi-mode."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 6-9, 11, and 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Welch et al. (U.S. Patent Pub. No. 2004/0033004, hereinafter "33004").

Regarding claims 1-3, the patent pub '33004 discloses an optical bandwidth source for generating the ASE across the particular wavelength range, comprising: a waveguide having a first end and a second end and a plurality of separate wavelength gain subsection arranged in a serial configuration between the first end and the second end, wherein each of the wavelength gain subsections is arranged relative to one another so as to produce ASE across the particular wavelength range (Fig. 9; and paragraphs [0109] and [0120]). The waveguide comprises a single mode waveguide and a multi-mode waveguide (Figs. 7, 7A, 31, 32, and 66; and paragraphs [0017], [0138], [0139], [0156], [0166], and [0204]).

Regarding claims 6-9 and 11, the patent pub '33004 discloses that the plurality of separate wavelength gain subsections of the waveguide comprise a quantum-well structure having a given gain profile in a direction from the first end of the waveguide toward the second end of the waveguide, wherein the gain profile comprises a bandgap

Art Unit: 2883

varying from lower to higher energy, the gain profile is varied in a discrete and/or a continuous fashion along a length of the waveguide, the quantum-well structure is formed by semiconductor regrowth, and at least a portion of the waveguide is curved between the first end and the second end (Figs. 7A and 7B; and paragraphs [0136]-[0138], [0151], [0173], [0179], [0203], and [0204]).

Regarding claims 21-23, the patent pub '33004 discloses a method for generating amplified spontaneous emission (ASE) across a particular wavelength range, the method comprising: providing a waveguide having a first end, a second end, and a plurality of separate waveguide gain subsections arranged in a serial configuration to form an active waveguide between the first end and the second end; and electrically biasing first and second waveguide gain subsections from the plurality of separate waveguide gain subsections, the first waveguide gain subsection being configured between the first end and the second waveguide gain subsection, the second waveguide gain subsection being configured between the second end and first waveguide gain subsection, and the first waveguide gain subsection configured with a quantum-well structure having a bandgap with lower energy than the second waveguide gain subsection so as to produce longer wavelength ASE at the first waveguide gain subsection than at the second waveguide subsection, wherein the waveguide produces ASE across the particular wavelength range at the second end thereof formed by ASE produced by the first waveguide section and the second waveguide section (Figs. 5, 7, 7A, 9, 21, 31, 32, 34, 45, 62A, and 66; and paragraphs [0017], [0109], [0120], [0129], [0136], [0138], [0139], [0143], [0156], [0166], and [0204]). The waveguide comprises a

single mode waveguide and a multi-mode waveguide (Figs. 7, 7A, 31, 32, and 66; and paragraphs [0017], [0138], [0139], [0156], and [0204]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 5, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent pub '33004.

The patent pub '33004 discloses the optical bandwidth source and method for generating ASE across a particular wavelength range.

The patent pub '33004 does not specifically disclose that the particular wavelength range has a width of at least 100 nm and about 200 nm.

It is known that InGaAsP type laser diodes or InGaAs type photodiodes can be utilized in 1.3 μm and 1.5 μm wavelengths. It is also known that compound semiconductor devices, such as GaAs based and InP based devices, have reception and emission wavelengths of, for example, 1.3 μm and 1.5 μm .

Therefore, it would have been obvious to one of ordinary skill in the art to generate ASE within wavelength of 1.3 μm and 1.5 μm (i.e., bandwidth of about 200 nm).

The motivation would have been to generate ASE across the commonly used wavelengths (i.e., 1.3 μm and 1.5 μm).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent pub '33004 in view of Fish et al. (U.S. Patent No. 6,614,819, hereinafter "Fish").

The patent pub '33004 discloses the optical bandwidth source for generating ASE across a particular wavelength range comprising the waveguide including a quantum-well structure formed by semiconductor regrowth.

The patent pub '33004 does not disclose that the quantum-well structure is formed by quantum-well intermixing.

Fish discloses laser assemblies having a quantum-well structure formed by either semiconductor regrowth or quantum-well intermixing.

It would have been obvious to one of ordinary skill in the art to form the quantum-well structure of the patent pub '33004 using quantum-well intermixing since both semiconductor regrowth and quantum-well intermixing are well known methods used to form a quantum-well structure.

9. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent pub '33004 in view of Kitamura (U.S. Patent No. 6,141,477).

Regarding claims 12-14, the patent pub '33004, as discussed in paragraph 5 above, discloses the optical bandwidth source for generating ASE comprising the waveguide, wherein at least a portion of the waveguide is curved between the first end

and the second end in order to reduce reflectivity. The curved portion of the waveguide forms an angle of about 7° . The optical bandwidth source further comprises an antireflection coating deposited adjacent to the second end of the waveguide (Fig. 41; and paragraph [0182]).

The patent pub '33004 does not disclose that the curved portion of the waveguide forms an angle within a range of about 8° to 13° . Further, the patent pub '33004 does not specifically disclose that the second end of the waveguide comprises a semiconductor facet having the antireflection coating disposed thereon.

Kitamura discloses an optical amplification element generating ASE comprising a waveguide with a curve between first and second ends of the waveguide to suppress the light reflection factor. Kitamura discloses that the curved portion forms an angle within a range of about 8° to 10° and the second end of the waveguide comprises a semiconductor facet having the antireflection coating (Figs. 1, 4, 6, and 7; column 1, lines 18-25; column 6, lines 42-65; column 8, lines 6-11 and 65-67; and column 9, lines 5-8 and 30-45).

It would have been obvious to one of ordinary skill in the art to modify the patent pub '33004 to form an angle of the curved portion of the waveguide to be within a range of about 8° to 10° and to form a semiconductor facet having the antireflection coating at the second end of the waveguide.

The motivation would have been to suppress the light reflection factor and prevent optical feedback into the optical bandwidth source.

Regarding claim 15, the combination of the patent pub '33004 and Kitamura discloses the optical bandwidth source generating ASE comprising the waveguide, wherein the second end of the waveguide comprises a semiconductor facet having the antireflection coating. Further, the patent pub '33004 discloses that a grating is provided at the first end of the waveguide (paragraph [0141]).

The combination of the patent pub '33004 and Kitamura does not disclose that the optical bandwidth source further comprises a mirror disposed at the first end of the waveguide.

It is well known that a mirror is used as highly reflecting coating. Further, it is well known that alternatively, a grating (a diffraction grating or fiber Bragg grating) can be use in place of the mirror. (For example, see U.S. Patent No. 6,804,281 and U.S. Patent Pub. No. 2002/0191904.)

Accordingly, it would have been obvious to one of ordinary skill in the art to modify the patent pub '33004 to substitute a mirror for the grating at the first end of the waveguide since these two are equivalents.

10. Claims 16 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent pub '33004 in view of Wu (U.S. Patent No. 6,751,013).

Regarding claims 16, 17, and 19, the patent pub '33004 discloses a system for generating amplified spontaneous emission (ASE) across a particular wavelength range, comprising: an optical bandwidth source for generating the ASE across the particular wavelength range, the optical bandwidth source comprising: a waveguide

having a first end and a second end and a plurality of separate wavelength gain subsection arranged in a serial configuration between the first end and the second end, wherein each of the wavelength gain subsections is arranged relative to one another so as to produce ASE across the particular wavelength range (Fig. 9; and paragraphs [0109] and [0120]); and a fiber pigtail configured to receive ASE emitted from the waveguide, wherein the waveguide comprises a single mode waveguide and the fiber pigtail is a single mode fiber pigtail (Figs. 7, 7A, 31, 32, and 66; and paragraphs [0017], [0138], [0139], [0156], [0166], and [0204]). The system further comprises a mounting substrate in thermal connection to a thermoelectric cooling device (TEC) and to the optical bandwidth source (Figs. 52, 65C, and 73; and paragraphs [0006], [0177], [0202], [0212], and [0214]).

The patent pub '33004 does not disclose a thin-film tap configured to divert a portion of the ASE; a power monitor configured to receive the portion of the ASE so as to monitor the ASE; and an isolator configured to receive the remaining portion of the ASE and to eliminate feedback toward the waveguide.

Wu discloses a system for generating ASE comprising: an optical bandwidth source; a tap configured to divert a portion of the ASE; a monitor configured to receive the portion of the ASE so as to monitor the ASE; an isolator configured to receive the remaining portion of the ASE and to eliminate feedback toward the waveguide; and a fiber pigtail configured adjacent to the isolator to receive ASE emitted from the waveguide after passing through the isolator (Fig. 2; column 3, lines 57-67; and column 4, lines 1-10 and 48-50).

It would have been obvious to one of ordinary skill in the art to modify the system of the patent pub '33004 to include a tap and a monitor to monitor ASE and an isolator to eliminate feedback toward the waveguide.

The motivation would have been to use such optical components to handle (or adjust) optical data signals in a signal band.

Regarding claim 18, the combination of the patent pub '33004 and Wu discloses the system for generating ASE, comprising: the optical bandwidth source comprising the waveguide and the fiber pigtail. Further, the patent pub '33004 discloses that the waveguide is multi-mode waveguide (Figs. 7, 7A, 31, 32, and 66; and paragraphs [0199], [0139], and [0166]).

The combination of the references does not disclose that the fiber pigtail is a multi-mode fiber pigtail.

The patent pub '33004 discloses that optical mode from the optical bandwidth source to the adjacent optical device should be matched to insure polarization insensitivity is preserved with low optical losses and lower optical back reflections ([0199]).

Accordingly, it would have been obvious to one of ordinary skill in the art to employ a multi-mode fiber pigtail with a multi-mode waveguide of the optical bandwidth source.

The motivation would have been to insure that polarization insensitivity is preserved with low optical losses and lower optical back reflections.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent pub '33004 in view of Wu as applied to claim 19 above, and further in view of Welch et al. (U.S. Patent Pub. No. 2003/0095737, hereinafter "95737").

The combination of the patent pub '33004 and Wu, as discussed in paragraph 10 above, discloses the system for generating ASE across a particular wavelength range comprising the mounting substrate.

The combination of the patent pub '33004 and Wu does not disclose that the mounting substrate is in aluminum nitride carrier.

The patent pub '95737 discloses a system for generating ASE comprising a mounting substrate in thermal connection to a TEC and to an optical bandwidth source. The mounting substrate is in aluminum nitride carrier (Figs. 8, 10, 12, and 21; and paragraphs [0208], and [0212]).

It would have been obvious to one of ordinary skill in the art to include the mounting substrate in aluminum nitride carrier.

The motivation would have been to package the system for generating ASE to form a module, for example, by employing flip-chip technology, by providing aluminum nitride carrier.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joanne H. Kim whose telephone number is (571) 272-2139. The examiner can normally be reached on 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joanne H. Kim
Examiner
Art Unit 2883

jhk/FGF



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800